First description of the nest and egg of Orange-crowned Fairy-wren *Clytomyias insignis*, from the southern highlands of Papua New Guinea

by Iain A. Woxvold & Francis H. J. Crome

Received 25 May 2011

The fairy-wrens and allies (Maluridae) comprise an Australo-Papuan family of small to mid-sized, predominantly insectivorous, passerines that frequent shrubby vegetation, grasslands and forest undergrowth (Rowley & Russell 1997, 2007). Two subfamilies are recognised: the Malurinae (fairy-wrens and emu-wrens), with 17 species in Australia and New Guinea; and the Amytornithinae (grasswrens), with ten species confined to Australia (Rowley & Russell 2007, Christidis & Boles 2008). Members of this family are highly social and live in sedentary, multi-member groups that remain together year-round. Cooperative breeding, where more than two individuals contribute to raise the young at a single nest (Brown 1987, Cockburn 1998), has been confirmed in most species where sufficient data exist (Higgins *et al.* 2001, Rowley & Russell 2007). These communal habits have made them a favoured subject of research, with some *Malurus* fairy-wrens among the most intensively studied of all Australian birds.

The situation is altogether different in New Guinea, where basic information on the ecology and breeding biology of the island's five endemic malurids remains piecemeal (Coates 1990, Rowley & Russell 2007).

The monotypic Orange-crowned Fairy-wren *Clytomyias insignis* is endemic to mainland New Guinea where it is widespread, albeit local and uncommon, in montane forest at 1,700–3,000 m (Diamond 1972, Coates 1990, Rowley & Russell 1997). It favours dense vegetation in the forest understorey or at the forest edge, where this fairy-wren gleans insects from foliage and feeds on the ground (Bell 1969, Diamond 1972, Coates 1990, Frith & Frith 1992).

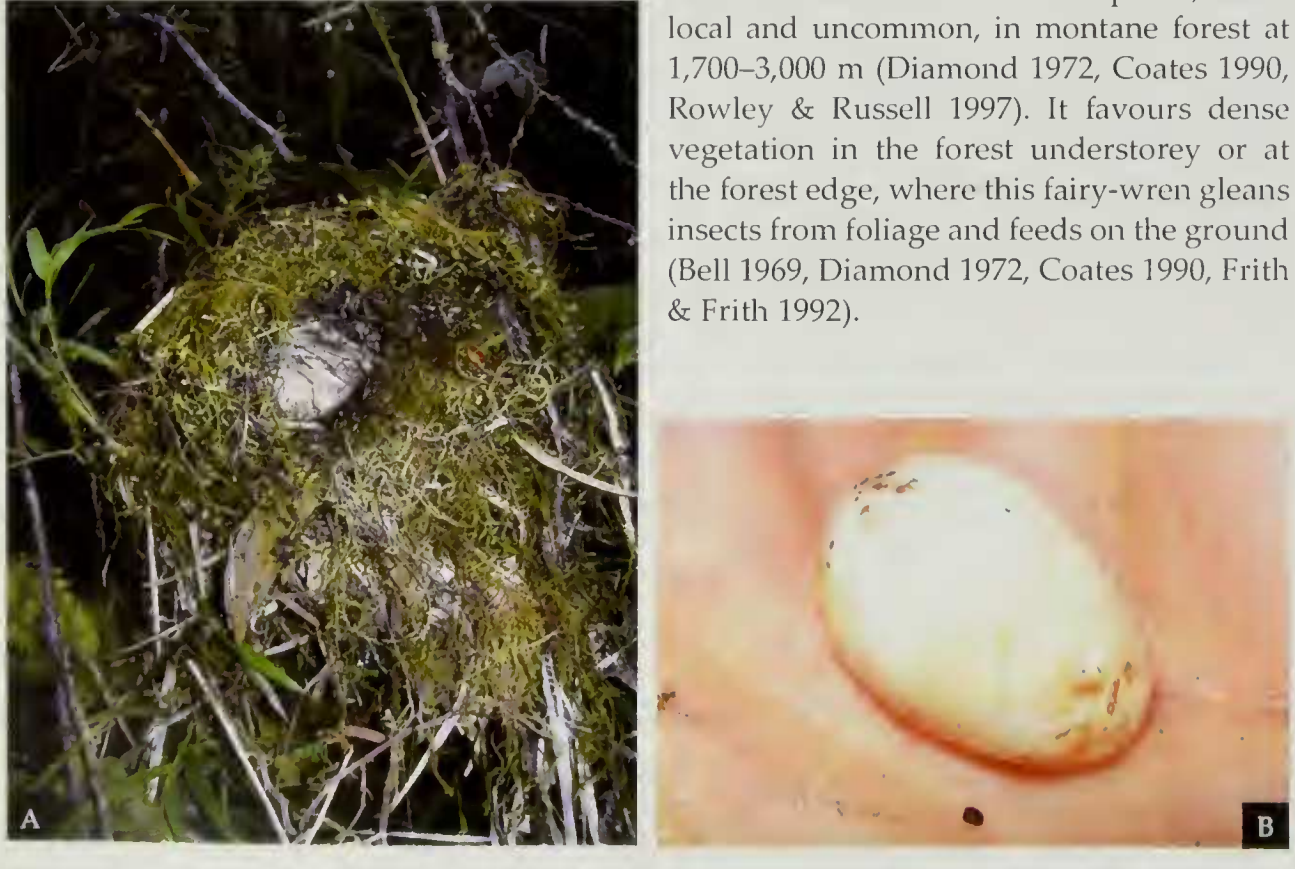

Figure 1. Nest (A) and egg (B) of Orange-crowned Fairy-wren *Clytomyias insignis*, Hides Ridge, Southern Highlands Province, Papua New Guinea, April 2005 (Iain Woxvold)

Of breeding virtually nothing is known. *Clytomyias* has regularly been observed in groups of more than two (Frith & Frith 1992, Davies 2008), and sometimes in parties of up to seven birds (Bell 1969), consistent with the notion that it may breed cooperatively. Internal examination has indicated breeding condition in birds collected at various localities across the central cordillera (e.g., Mayr & Gilliard 1954, Ripley 1964), including a female that 'contained two nearly formed eggs' (Diamond 1972: 217). Here we provide the first description of the nest and eggs of *Clytomyias*.

In 2005 we surveyed birds on Hides Ridge (05°56.9'S, 142°44.7'E), part of a limestone range rising nearly 1,000 m above the Tagari River valley and located *c*.25 km west-southwest of Tari in the Southern Highlands Province of Papua New Guinea. Habitat consisted of primary montane *Nothofagus* moss forest overlying karst terrain with numerous sinkholes. Extensive thickets of climbing bamboo *Nastus productus* were present on hilltops and ridges.

On the afternoon of 25 April, while investigating a small (*c*.5 m diameter) swampy pool at the base of a sinkhole depression (at *c*.2,150 m), our attention was drawn to an area near the foot of the slope by a continuous series of harsh, scolding calls. Viewing the area from 5–7 m distance we noticed a *Clytomyias insignis* at the entrance of a domed nest. Calling persisted for some minutes while the bird looked into but did not enter the nest, and then continued from within the nest after the bird had left. The calls were recorded and can be examined at xeno-canto (www.xeno-canto.org/asia/; XC64640). As we approached the nest, a second bird emerged and flew into the forest upslope.

The nest (Fig. 1A) was placed *c*.0.8 m above steep sloping ground in a shrubby vine *Parsonsia sanguinea* situated *c*.2–3 m above the sinkhole floor and a similar distance from the forest edge at its boundary with the swampy pool. The nest framework was constructed predominantly of interwoven *P. sanguinea* leaves and decorated with live moss which covered the exterior of the nest and hung from its base to form a 'beard' of *c*.15 cm. Moss has been reported among materials used by a number of tropical malurines (Rowley & Russell 1997), including some New Guinea species (Ripley 1964, Diamond 1981), and may serve a dual purpose of water-proofing and camouflage. The exterior of the main structure measured *c*.16 × 12 cm (width × depth), these dimensions being taken at the nest's widest plane and at the perpendicular. The entrance measured *c*.6 × 4 cm (width × height), was located centrally in the nest wall and faced away from the slope and towards an edge of the clearing above the sinkhole pool. A slight hood projected above the entrance, a character noted in many other malurid nests, and in this case at least partially attributable to the trampling of its lower edge by regular visits. The nest was positioned at an angle of *c*.40° to the horizontal, the pattern of trampling at the entrance rim suggesting it may have tilted following recent disturbance.

The nest contained two eggs. One was removed and photographed (Fig. 1B) before we left the area. The egg was of long subelliptical shape, matte white with small pinkish-brown splotches restricted (or nearly so) to the base of the blunt end. Overall colour and the distribution of markings are similar to other malurine eggs (Schodde 1982, Rowley & Russell 1997). Although more sparsely marked than most other malurine eggs, more examples are needed to determine whether this is the norm.

On returning the following morning to document the clutch in more detail, the nest was empty and the birds could not be located. The cause of failure was not determined, though abandonment seemed probable as the nest remained intact and no shell fragments or feathers were found. Following our visit, the nest area was subject to additional traffic as a walking track was established that led past the sinkhole pool.

The egg pictured is conservatively estimated to measure 20.5–21.8 mm long and 14.0–15.0 mm wide at its broadest point. Dimensions were measured indirectly by calculating

the distance between dermal ridges on the hand photographed (three measures taken). The *Clytomyias* egg is appreciably larger than those known to date from all other malurines, the largest heretofore being the eggs of Superb Fairy-wren *Malurus cyaneus* (at 16–19 mm × 12–14 mm), and within the range of those laid by the larger amytornithines (Rowley & Russell 1997). Egg size increases with body mass in malurids (Rowley & Russell 1997) as in other birds (Rahn *et al.* 1975). Of those malurines whose eggs have been described, *Clytomyias* is the heaviest (at 10–14 g) and most similar in body mass to *M. cyaneus* (at 9–14 g) (Rowley & Russell 2007). The eggs of Broad-billed Fairy-wren *M. grayi* and Emperor Fairy-wren *M. cyanocephalus*, both from New Guinea, are yet to be described. These are the heaviest of all malurines and their eggs may yet prove proportionately superior.

Most malurids lay 2–4 eggs (Rowley & Russell 2007). In this case the final clutch size could not be determined.

While most malurines are strongly sexually dimorphic, male and female *Clytomyias* are indistinguishable in size and plumage (Rowley & Russell 2007), and it was not possible to determine the sex of the attendant adults. As only two birds were seen, cooperative breeding in this instance was neither confirmed nor denied.

Acknowledgements

We are grateful to W. Takeuchi for providing plant identifications, T. Mamu, G. Richards, S. Richards and W. Takeuchi for their assistance and company in the field, ExxonMobil Corporation for their logistical and financial support, and local Huli residents for their assistance in the field and permission to work on their land. Eleanor Rowley and Bruce Beehler provided valuable comments on the submitted version.

References:

Bell, H. L. 1969. Field notes on the birds of the Ok Tedi River drainage. *Emu* 69: 193–211.

Brown, J. L. 1987. *Helping and communal breeding in birds: ecology and evolution*. Princeton Univ. Press.

Christidis, L. & Boles, W. E. 2008. *Systematics and taxonomy of Australian birds*. CSIRO Publishing, Melbourne.

Coates, B. J. 1990. *The birds of Papua New Guinea, including the Bismarck Archipelago and Bougainville*, vol. 2. Dove Publications, Alderley.

Davies, C. 2008. Mount Trikora, Snow Mountains, West Papua, Indonesia 2–17 July 2007. *Muruk* 9: 41–47.

Cockburn, A. 1998. Evolution of helping behavior in cooperatively breeding birds. *Ann. Rev. Ecol. & Syst.* 29: 141–177.

Diamond, J. M. 1981. Distribution, habits and nest of *Chenorhamphus grayi*, a malurid endemic to New Guinea. *Emu* 81: 97–100.

Diamond, J. M. 1972. *Avifauna of the eastern highlands of New Guinea*. Publ. Nuttall Orn. Cl. 12. Nuttall Orn. Cl., Cambridge, MA.

Frith, C. B. & Frith, D. W. 1992. Annotated list of birds in western Tari Gap, Southern Highlands, Papua New Guinea, with some nidification notes. *Australian Bird Watcher* 14: 262–276.

Higgins, P. J., Peter, J. M. & Steele, W. K. (eds.) 2001. *Handbook of Australian, New Zealand and Antarctic birds*, vol. 5. Oxford Univ. Press, Melbourne.

Mayr, E. & Gilliard, E. T. 1954. Birds of central New Guinea. Results of the American Museum of Natural History Expeditions to New Guinea in 1950 and 1952. *Bull. Amer. Mus. Nat. Hist.* 103: 311–374.

Rahn, H., Paganelli, C. V. & Ar, A. 1975. Relation of avian egg weight to body weight. *Auk* 92: 750–765.

Ripley, S. D. 1964. A systematic and ecological study of birds of New Guinea. *Peabody Mus. Nat. Hist., Yale Univ. Bull.* 19: 1–87.

Rowley, I. & Russell, E. 1997. *Fairy-wrens and grasswrens*. Oxford Univ. Press.

Rowley, I. & Russell, E. 2007. Family Maluridae (fairy-wrens). Pp. 490–531 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 12. Lynx Edicions, Barcelona.

Schodde, R. 1982. *The fairy-wrens: a monograph of the Maluridae*. Lansdowne, Melbourne.

Addresses: Iain A. Woxvold, Dept. of Zoology, University of Melbourne, Victoria 3010, Australia, e-mail: iainwoxvold@gmail.com. Francis H. J. Crome, P.O. Box 450, Clifton Hill, Victoria 3068, Australia.